

## **REMARKS**

Claims 20-54 are pending in this application. Claims 34 and 35 have been amended to correct a typographical error. The specification has been amended to correct a typographical error pointed out by the Examiner.

In an effort to materially advance prosecution of this application, independent claims 20 and 42 have been amended. Applicant believes that no new matter has been added.

### **Rejections Under 35 U.S.C 102(b)**

Claims 20, 22, 38, 40, 42, 46, 49, and 52 stand rejected under 35 U.S.C. 102(e) as being anticipated by Perahia et al. (U.S. patent 7,352,688). In response, and to clarify the claim language, Applicant has amended claims 20 and 42. Support for these amendments is found in paragraphs [0005], [0012], [0030], [0031], [0032] and [0033] of the published patent application.

With respect to amended independent claims 20 and 42, the Examiner has asserted that Perahia teaches “assigning different polarizations to the signals that are to be transmitted and received on the sub-channels.” However, Perahia performs this assignment of polarization by merely sending each sub channels to an antenna selected to have a given polarization. The polarization of the transmitted signal is then determined by the polarization of the antenna to which that signal was sent for transmission. Thus the assignment of polarization diversity to m sub channels requires the use of at least m antennae, each with a distinct polarization. (See Perahia, column 4, lines 11-21, and column 5, lines 6-15.)

Claims 20 and 42, as amended, define a markedly different method and structure for assigning a polarization to the signal on each sub channel which is to be transmitted to create polarization diversity. The signal on each sub channel has its polarization generated through the use of delay lines which are made part of that signal's flow path. The signals from all of the sub channels, each with different polarizations applied by delay line structures, are then superimposed and sent to an antenna for transmission.

Perahia does not teach the use of delay lines to generate the polarization in the signals on each sub channel. Indeed, Perahia does not suggest any other means of assigning polarization to the signals on the sub channels other than mapping them to antennae with different polarizations. Nor does Perahia teach superimposing all of the differently polarized signals from the sub channels to an antenna comprised of closely spaced partial antennae for transmission. This novel aspect of the current invention is made possible by the use of delay lines to generate the polarizations of the signals from the sub channels before the signals are sent to the antenna for transmission, enabling the use of a much more compact antenna structure than is possible using the methods disclosed in Perahia.

In accord with MPEP 2131, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Since neither of the aforementioned elements - the use of delay lines to generate the polarization of the signals from the sub channels and the conveyance of a superimposition of all of the signals from the sub channels to an antenna comprised of closely spaced partial antennae - is expressly or inherently described, or in any way suggested, in Perahia, this reference does not anticipate claims 20 or 42, as amended. Therefore, Applicant believes these claims as amended are now in condition for allowance.

Claims 22, 38, and 40 depend from claim 20, and claims 46, 49, and 52 depend from claim 42. Applicant therefore believes that these dependent claims are now also in condition for allowance for at least the same reasons as are claims 20 and 42.

#### **Rejections under 35 U.S.C 103(a)**

Dependent claims 21, 23-37, 39, 40, 43-45, 47, 48, 50, 51, 53, and 54 stand rejected under 35 U.S.C. 103(a) as being unpatentable under Perahia in view of one or more of the following references cited by the Examiner:

Shnitkin et al. (US 3,836,973)

Witte (US 3,603,987)

Poggiolini (US 5,127,066)

Green et al. (US 5,949,762)

Glance (US 4,723,316)

Marshall et al. (US 5,090,025)

Dent et al. (US 6,181,920)

Claims 21, 23-37, 39, 40 depend from claim 20; hence they contain all of the elements of claim 20 as amended. Claims 43-45, 47, 48, 50, 51, 53, and 54 depend from claim 42; hence they contain all of the elements of claim 42 as amended. Thus each of these dependent claims contains the element of the inserting delay lines into the radio signal flow paths of the sub channels to generate active polarizations and the element of superimposing the radio signals of the sub channels with different polarizations and conveying the superimposed signals to an antenna.

As noted above, there is no disclosure of or discussion which would suggest either of these elements in Perahia. Applicant has carefully reviewed all of the additional references listed above. There is no disclosure in any of them of either of these elements. Shnitkin deals with the polarization of incoming radio frequency signals and the use of multiple antennae to detect signals of different polarizations; processing of signals to be transmitted is no relevance to this matter. Witte deals with a radio wave radiator with a mechanical structure to create signals of different polarizations. Dent discloses a radio signal transmitter which polarizes the signals by routing them to various polarized antennae. There is no discussion in any of these three references that would suggest to one of ordinary skill in the art at the time of the current invention the use of delay lines to generate polarization of radio signals to be transmitted nor of the superimposition of signals from sub channels for conveyance to an antenna.

Poggiolini and Glance deal with optical signal transmission systems. The use of delay lines to generate polarization of radio signals and the use of antennae are not related to the subject matter of these references.

Green deals with a telephone call processor and Marshall relates to network

node optimization in local area networks. There is no relevance of radio signal polarization or radio signal transmission to the subject matter of these references.


In view of these facts, Applicant argues that there is no basis to support an assertion that one of ordinary skill in the art at the time of the current invention would find these elements of the listed dependent claims obvious based on any or all of the references cited by the Examiner. Therefore, Applicant believes all of these dependent claims are now also in condition for allowance and respectfully requests that the Examiner remove this ground of rejection for these dependent claims.

### **Conclusion**

In light of the preceding Remarks and the amendments made to the claims, Applicant believes that all claims pending in this application are now in condition for allowance. Applicant requests reconsideration and that a Notice of Allowance be issued timely. Should there be any issues that have not been addressed to the Examiner's satisfaction, Applicant invites the Examiner to telephone the undersigned attorney.

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